REMARKS

Claims 10-18 are pending in this application. By this Amendment, claims 10, 13, 14 and 16-18 are amended only for antecedent basis. No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments are merely for form; and (c) place the application in better form for appeal, should an appeal be necessary. Entry of the amendments is thus respectfully requested.

The Office Action rejects claims 10-18 under 35 U.S.C. §112, second paragraph. Applicant respectfully traverses the rejection.

The Office Action alleges that claims 10-18 are allegedly "incomplete for omitting essential elements, such omission amounting to a gap between the elements," citing MPEP §2172.01. The Office Action alleges that structural connectivity of a controller unit and sensors with the engine system are omitted. However, neither the specification nor any other statement of record defines the structural connectivity of the controller unit and the sensors as being "essential."

According to the MPEP, "[A] claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. 112, second paragraph, for failure to point out and distinctly claim the invention." MPEP §2172.01. The specification does not define the allegedly omitted features as being "essential." Thus, the claims are not indefinite.

Additionally, "it is not essential to a patentable combination that there be interdependency between the elements of the claimed device or that all the elements operate concurrently toward the desired result." MPEP §2172.01, *citing Ex parte Nolden*, 149 USPQ 378, 380 (Bd. Pat. App. 1965). "A claim does not necessarily fail to comply with 35 U.S.C.

112, second paragraph where the various elements do not function simultaneously, are not directly functionally related, do not directly intercooperate, and/or serve independent purposes." *Id.*, *citing Ex parte Huber*, 148 USPQ 447, 448-49 (Bd. Pat. App. 1965). Although the Office Action asserts that the structural connectivity between the controller and the sensors is essential, the above case law holds that such structural relationships need not be recited in the claims. Thus, Applicant submits that claims 10-18 are definite.

The claims are not indefinite - the claims are merely broad. It is well settled that breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). Rather, undue claim breadth is better analyzed under the novelty, obviousness, written description or enablement requirements. MPEP §2173.04. Unless a claim is "insolubly ambiguous," the claim is not invalid for indefiniteness. See MPEP §2173.02, *citing Metabolite Labs., Inc. v. Lab Corp. of Am. Holdings*, 370 F.3d 1354, 1366, 71 (Fed. Cir. 2004). Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claim 10-12, 14-16 and 18 under 35 U.S.C. §103(a) over Saito et al., JP-A-2003-206722. Applicant respectfully traverses the rejection.

Saito fails to disclose and would not have rendered obvious the claimed combinations of features recited in independent claims 10, 14 and 18. Saito fails to disclose "a supercharger which includes a turbine that is provided in the exhaust passage at a position upstream of the catalyst," as recited in independent claims 10, 14 and 18.

The Office Action admits that Saito "fails to disclose the position of the turbine being provided in the exhaust passage at a position upstream of the catalyst having an oxidizing ability, or the position of the catalyst having an oxidizing ability and being provided in the exhaust passage at a position downstream of turbine." To remedy this deficiency, the Office Action asserts that "the positioning of the turbine being in the exhaust passage at a position upstream of the catalyst having an oxidizing ability, or the positioning of the catalyst having

an oxidizing ability and being provided in the exhaust passage at a position downstream of the turbine in the above claimed positions would have been obvious to one having ordinary skill in the art." The Office Action provides no support for this conclusory assertion other than alleging that "the arrangement of these devices would have reduced exhaust emissions." Yet, none of the applied references (including Saito) suggest that moving Saito's catalyst to upstream of Saito's turbine would reduce emissions. The Office Action has provided no factual support for the above assertion. There is no basis for the allegation in the Office Action that the arrangement of these devices would have reduced exhaust emissions.

Indeed, Saito discloses an advantage of its disclosed location of the catalyst. That is, Saito discloses that the filter 21 is heated by the hot exhaust gas provided to the filter, and the exhaust gas is heated by the decrease in the boost pressure caused by the combustion of CO and HC due to the catalytic reaction at the catalyst (see paragraph [0043] of Saito). When the location of the catalyst is changed, this advantage cannot be realized. Therefore, one of ordinary skill would not have been led to change the location of the catalyst (as proposed by the Office Action) because doing so would eliminate the above advantage.

As acknowledged by the Office Action, Saito fails to specifically disclose "a supercharger which includes a turbine that is provided in the exhaust passage at a position upstream of the catalyst," as recited in independent claim 10. Further, there is no basis for modifying the structure of Saito to include the above feature, as shown by the lack of evidence supporting the Office Action's assertion. Indeed, the specific teachings of Saito provide an advantage for its disclosed location of the catalyst, and would not have motivated one of ordinary skill to eliminate this advantage by moving the catalyst location. Applicant respectfully requests withdrawal of the rejections.

The Office Action rejects claims 10-12, 14-16 and 18 under 35 U.S.C. §103(a) over Saito in view of either Kobayashi et al., JP-A-2003-278536, or Nagae, JP-A-2002-070536. Applicant respectfully traverses the rejection.

In justifying the combination of references, the Office Action alleges that the combination would have been obvious to one having ordinary skill in the art "to prevent/solve a clogging/accumulating of particulate matter or soot when the exhaust gas is to be discharged to the atmosphere." In the alternative, the Office Action alleges that the combination "would have yielded predictable results, namely, to prevent/solve a clogging/accumulating of particulate matter or soot when the exhaust gas is to be discharged to the atmosphere." Applicant respectfully disagrees.

As discussed in the present specification, arranging a turbine and catalyst as claimed presents technical difficulties that are neither disclosed nor addressed in the prior art of record. As discussed in the present specification,

> [in an] internal combustion engine including a centrifugal supercharger, even when the temperature of the exhaust gas released from the internal combustion engine is increased, the energy of the exhaust gas is used for increasing a rotational speed of a turbine. Accordingly, the temperature of the exhaust gas flowing from the NOx catalyst cannot be increased sufficiently. Also, as the energy of the exhaust gas is used for increasing the rotational speed of the turbine and therefore the rotational speed of the turbine increases, a rotational speed of a compressor also increases and an amount of air taken in a cylinder increases. Accordingly, the intake air amount needs to be adjusted by decreasing an opening amount of an intake throttle valve. As a result, a pumping loss of the internal combustion engine increases, which causes deterioration of fuel efficiency.

Applicant's specification at page 2, line 28 - page 3, line 4.

As noted in the specification, the applied references fail to recognize a problem in the prior art: "In order to address this problem, a technology is proposed, in which a variable nozzle provided in the centrifugal supercharger or a wastegate valve is fully open such that

the energy of the exhaust gas is prevented from being used for increasing the rotational speed of the turbine." Applicant's specification at page 3, lines 5-8. With this potential solution to the problems with the prior art, "an amount of energy of the exhaust gas, which is used for increasing the rotational speed of the turbine, decreases. As a result, the intake air amount becomes smaller than that before the variable nozzle or wastegate valve is fully opened, which may cause an increase in amount of smoke." Applicant's specification at page 3, lines 12-15.

None of the applied references recognizes this problem or proposes a solution to the problem. Thus, Applicant discovered the source of the problem solved by the claimed invention. This is part of the "subject matter as a whole" that must be considered by the Examiner. *See* MPEP §2141.02(III) and (IV). Thus, the combination of claimed features would not have been obvious from the applied references as alleged in the Office Action. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 13 and 17 under 35 U.S.C. §103(a) over Saito in view of Kobayashi or Nagae and Kawamoto, JP-A-2003-120353. Applicant respectfully traverses the rejection.

Claim 13 recites "the turbine rotation controller decreases the amount of energy of the exhaust gas ... when a value detected by the intake air amount detector or the intake air pressure detector after the after-injection is performed is higher than a value detected by the intake air amount detector or the intake air pressure detector before the after-injection is performed." In rejecting claim 13, the Office Action alleges that Kawamoto discloses these features in paragraph [0030]. Applicant respectfully disagrees.

In the cited portion of Kawamoto, "after-injection" is adjusted based on the boost pressure. In contrast, claim 13 recites that the turbine rotation controller decreases the amount of energy of the exhaust gas. Thus, Kawamoto fails to disclose the features of claim

13 as alleged in the Office Action, and the Office Action fails to provide reasoning why these features would have been obvious.

Claim 17 recites "decreasing the amount of energy of the exhaust gas...when a value detected by the intake air amount detector or the intake air pressure detector after the after-injection is performed is higher than a value detected by the intake air amount detector or the intake air pressure detector before the after-injection is performed." Thus, claim 17 is patentable at least for the reasons discussed above with respect to claim 13. Applicant respectfully requests withdrawal of the rejection.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Patrick T. Muffo
Registration No. 60,342

JAO:PTM/emd

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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